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# Determining Provenance of Glacial Material in Southwestern Ohio

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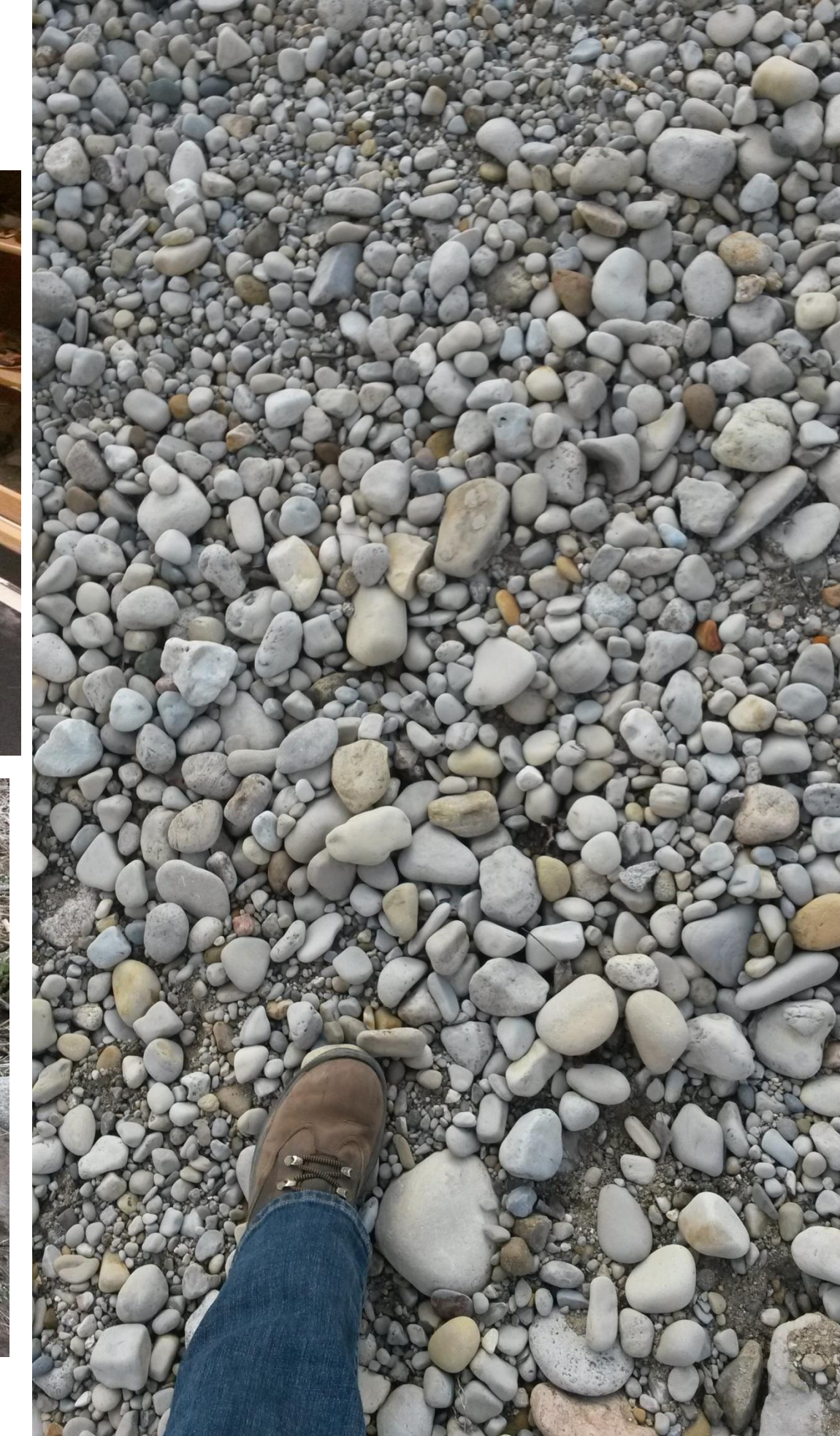


# Determining Provenance of Glacial Material in Southwestern Ohio

Jorie Krob | Geology Major | Cedarville University

## Project overview

During the last glacial maximum, ice moved south from Canada to cover much of the northern United States. As the ice scraped, slid, and shifted its way over the underlying landscape, material was picked up and entrained in the ice. When the ice began to melt and the glacier retreated, this material was dropped from the ice and left wherever it was. This is why volcanic and metamorphic rocks can be found in a non-volcanic/tectonic area like southwestern Ohio. The goal of this project was to determine from where in Canada the glacial material in southwestern Ohio originated. I looked at rocks obtained in Greene, Clark, Champaign, Logan, and Montgomery Counties. I sampled overburden material at two mine sites in Greene and Clark Counties, material from a kame deposit in Greene County, boulders from a field in Champaign and Logan Counties, and two cores from Montgomery and Clark Counties.



## Methods

After collecting rock samples from the various locations, I categorized the rocks based on basic composition, roundness, size, fossils, and foliations. I determined the composition by using a hand lens, using dilute HCl to check for calcium carbonate, and looking at the color. The HCl and fossil tests were to rule out any native Ohio rock, which are mainly carbonates and rich in fossils. I used the QAPF diagram to roughly classify the igneous rocks (a true classification is not possible without thin section analysis). The foliations indicated metamorphic rock. I looked at many maps of the bedrock in southern Canada in order to match up what was on the maps with what I found.

## Results

After much literature review and pouring over maps of the bedrock in southern Ontario and Quebec, I believe that the glacial material found in southwestern Ohio in Greene, Clark, Champaign, Logan, and Montgomery Counties originated from the Sudbury County area in southern Ontario as well as Ottawa County in Ontario and Les Collines-de-l'Outaouais County in Quebec. These areas have the closest exposed bedrock to Ohio that are of similar material to what I found during my analysis. When compared with a map showing the direction of the ice flow, my results are consistent with the flow direction.

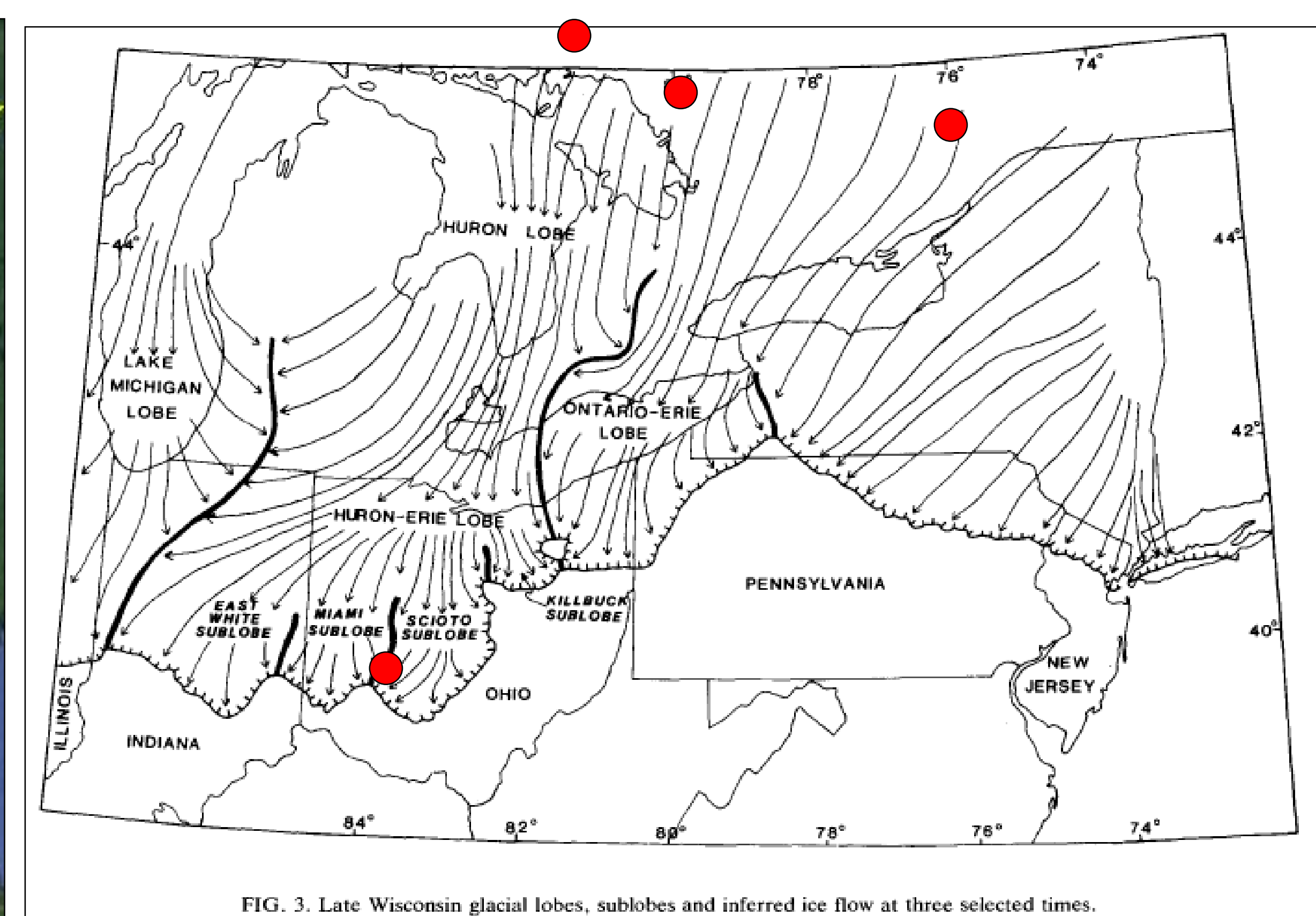
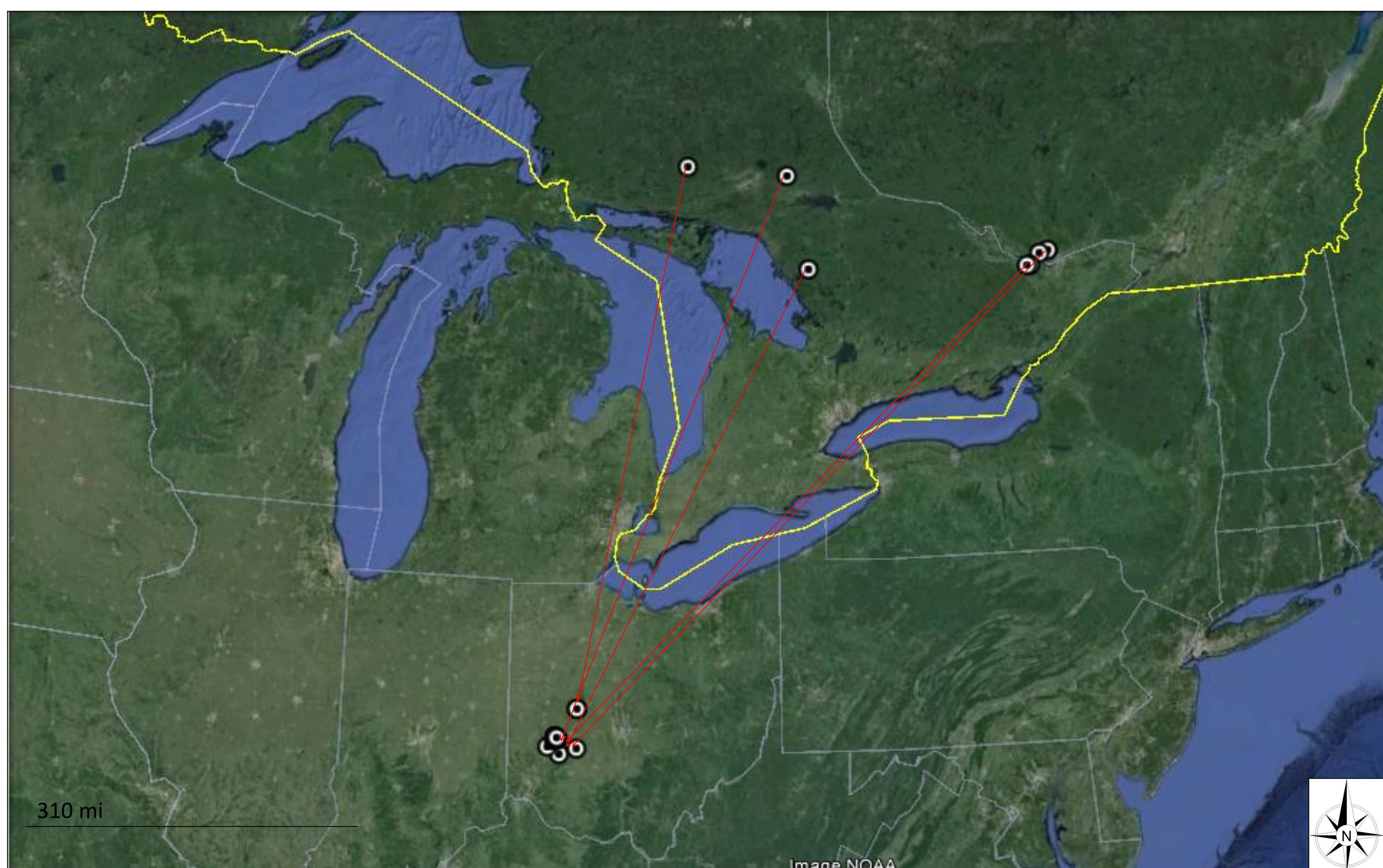


FIG. 3. Late Wisconsin glacial lobes, sublobes and inferred ice flow at three selected times.

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